

Code No: 115EB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech III Year I Semester Examinations, February/March - 2016

LINEAR AND DIGITAL IC APPLICATIONS

(Common to ECE, BME)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

Part- A**(25 Marks)**

- 1.a) Give the ideal values and practical values of various op-amp parameters. [2]
- b) Define thermal drift and slew rate. [3]
- c) Write the applications of 555 timer in astable mode. [2]
- d) What are the modes of operation of a timer? [3]
- e) Explain the principal of weighted resistor type DAC. [2]
- f) List the specifications of DAC. [3]
- g) Define Priority Encoder. [2]
- h) Write the Classification of Integrated Circuits. [3]
- i) Name different Types of ROMs. [2]
- j) List the applications of ROMs. [3]

Part-B**(50 Marks)**

- 2.a) What are the three differential amplifier configurations? Compare and contrast these configurations. [6+4]
 - b) Explain frequency compensator techniques used in op-amp. [6+4]
- OR**
- 3.a) Calculate the effect of variation in power supply voltages on the output offset voltage for an op-amp circuit. [6+4]
 - b) Explain the advantages and disadvantages of ICs. [6+4]
4. Give the functional block diagram of VCO NE566 and explain its working and necessary expression for free running or center frequency. [10]
- OR**
- 5.a) Explain the monostable operation of the 555 timer and derive the expression for the period of a pulse generated by the Timer. [5+5]
 - b) Design a circuit to generate square waveform using op-amp. [5+5]
6. Draw the block diagram and explain the operation of dual slope A/D converter. What are its advantages and disadvantages? [10]
- OR**
- 7.a) Explain the operation of the fastest analog to digital converter. What is the main drawback of this converter? Compare this converter with other types. [5+5]
 - b) Draw the circuit of a Ladder type DAC for 4 bits and derive expression for output voltage. [5+5]

8. Design and explain the following
- a) Basic comparator operation.
 - b) Logic diagram for comparison of 2-bit binary numbers. [5+5]

OR

- 9.a) Design a 2-input NOR gate using CMOS transistors. Explain the operation of the circuit with the help of function table.
- b) Discuss about LED and LCD decoders with drivers. [7+3]

- 10.a) Draw the internal structure of synchronous SRAM and explain the operation.
- b) Design and explain 1T1R1C DRAM Cell. [5+5]

OR

- 11.a) Explain the functional behavior of Static RAM cell. Show the internal structure of 8x4 static RAM.
- b) Design an 8-bit parallel-in and serial-out shift register. Explain the operation of the above shift register with the help of timing waveforms. [5+5]

